[Federal Register: December 10, 1999 (Volume 64, Number 237)]
[Proposed Rule]
[Page 69357-69364]
From the Federal Register Online via GPO Access [wais.access.gpo.gov]
[DOCID:fr10de99-20]

[[Page 69357]]

Part III

Environmental Protection Agency

---

40 CFR Part 761

Use Authorization for, and Distribution in Commerce of, Non-liquid Polychlorinated Biphenyls; Notice of Availability; Partial Reopening of Comment Period; Proposed Rule

[[Page 69358]]

ENVIRONMENTAL PROTECTION AGENCY

40 CFR Part 761

[OPPTS-66009F; FRL-6064-7]
RIN 2070-AD27

Use Authorization for, and Distribution in Commerce of, Non-liquid Polychlorinated Biphenyls; Notice of Availability; Partial Reopening of Comment Period

AGENCY: Environmental Protection Agency (EPA).

ACTION: Proposed rule; notice of data availability; partial reopening of comment period.

SUMMARY: This action announces the availability of data that were submitted to EPA after the comment period closed for the December 6, 1994 proposal on the disposal of polychlorinated biphenyls (PCBs). This

action also solicits additional information on the potential risks of exposure to PCBs, and the use and concentration of PCBs found in certain non-liquid PCB (NLPCB) applications. In the proposal of December 6, 1994, EPA solicited comment on a provision that would authorize the use of certain NLPCB applications (i.e., proposed Sec. 761.30(q)). In addition to authorizing these uses, the proposed provision would have required compliance with several conditions (e.g., notification, marking, air monitoring and standard wipe tests, remediation, repair and/or removal, reporting and recordkeeping requirements). EPA is particularly interested in data regarding the PCB concentration and route(s) of exposure to PCBs found in the NLPCB applications that are the subject of this action and the associated risks of exposure. This action starts a 120-day data submission period which will be followed by an additional 90-day period for public comment on existing and new data submissions. Since EPA may rely on the data submissions that are generated as a result of this action to develop a final rule to authorize the use of these NLPCB applications, the Agency is providing the additional 90-day comment period for parties who are interested in reviewing and commenting on any of the existing or newly submitted data.

DATES: Data submissions must be received by EPA on or before April 10, 2000. Comments must be received by EPA on or before July 7, 2000.
ADDRESSES: Comments may be submitted by mail, electronically, or in person. Please follow the detailed instructions for each method as provided in Unit III. of the ``SUPPLEMENTARY INFORMATION'' section. To ensure proper receipt by EPA, it is imperative that you identify docket control number OPPTS-66009F in the subject line on the first **page** of your response.

FOR FURTHER INFORMATION CONTACT: For general information contact: Christine Augustyniak, Associate Director, Environmental Assistance Division (Mail Code 7408), Office of Pollution Prevention and Toxics, Rm. E-543B, Environmental Protection Agency, 401 M St., SW., Washington, DC 20460; telephone: (202) 554-1404, TDD: (202) 554-0551, e-mail: TSCA-Hotline@epa.gov.
For technical information contact: Peggy Reynolds, Environmental Protection Agency, (Mail Code 7404), 401 M St., SW., Washington, DC 20460; telephone: (202) 260-3965, fax: (202) 260-1724, e-mail: reynolds.peggy@epa.gov.
SUPPLEMENTARY INFORMATION:

I. Does this Action Apply to Me?

You may be affected by this supplemental action if you own, use, process or distribute PCBs in commerce. Affected categories and entities include:

Category	Examples of Affected Entities
Industry	Electroindustry manufacturers, end-users of electricity and general contractors
Utilities and rural electric cooperatives	Electric power and light companies
Individuals, Federal, State, and Municipal	Individuals and agencies

Governments	which own, use, process and distribute PCBs in commerce

This table is not exhaustive, but lists the types of entities that could potentially be affected by this action. Other types of entities may also be interested in this action. To determine whether your entity is affected by this action, carefully examine the applicability criteria in Title 40 of the Code of Federal Regulations (CFR), part 761. If you have any questions regarding the applicability of this action to a particular entity, you should consult the applicable regulations, or the technical contact listed in ``FOR FURTHER INFORMATION CONTACT'' for the referenced final rule.

II. How Can I Get Additional Information, Copies of this Document, and Support Documents?

1. Electronically. You may obtain electronic copies of this document on the Internet from the EPA Home **Page** at http://www.epa.gov. An electronic copy of this document can be found under the ``Federal Register-Environmental Documents'' listing and the date of the publication of this document in the Federal Register (http://www.epa.gov/fedrgstr/EPA-TOX/1999/).

2. In person. The official record for this action, including the public version, has been established under docket control number OPPTS-66009F. The official record also includes all material and submissions filed under docket control number OPPTS-66009C, the record for the referenced final rule. The public version of the record, including printed, paper versions of any electronic comments, which does not include any information claimed as confidential business information (CBI), is available for inspection in the TSCA Nonconfidential Information Center, Northeast Mall Rm. NE-B607, 401 M St., SW., Washington, DC. The Center is open from noon to 4 p.m., Monday through Friday, excluding legal holidays. The telephone number of the Center is (202) 260-7099.

III. How and to Whom Do I Submit Comments?

You may submit comments through the mail, in person, or electronically. To ensure proper receipt by EPA, it is

[[**Page** 69359]]

imperative that you identify docket control number OPPTS-66009F in the subject line on the first **page** or your response.

1. By mail. Submit your comments to: Document Control Office (7407), Office of Pollution Prevention and Toxics (OPPT), Environmental Protection Agency, 401 M St., SW., Washington, DC 20460.

2. In person or by courier. Deliver your comments to: OPPT Document Control Office (DCO) in the East Tower Rm. G-099, Waterside Mall, 401 M St., SW., Washington, DC. The DCO is open from 8 a.m. to 4 p.m., Monday through Friday, excluding legal holidays. The telephone number for the DCO is 202-260-7093.

3. Electronically. You may submit your comments electronically by e-mail to: ``oppt.ncic@epa.gov,'' or mail your computer disk to the address identified above. Do not submit any information electronically that you consider to be CBI. Electronic comments must be submitted as an ASCII file avoiding the use of special characters and any form of encryption. Comments will also be accepted on standard computer disks in Wordperfect 6.1/0.0 or ASCII file format. All comments in electronic form must be identified by the docket control number OPPTS-66009F. Electronic comments may also be filed online at many Federal Depository Libraries.

IV. How Should I Handle CBI Information That I Want to Submit to the Agency?

Do not submit any information electronically that you consider to be CBI. You may claim information that you submit to EPA in response to this document as CBI by marking any part or all of that information as CBI. Information so marked will not be disclosed except in accordance with procedures set forth in 40 CFR part 2. In addition to one complete version of the comment that includes any information claimed as CBI, a copy of the comment that does not contain the information claimed as CBI must be submitted for inclusion in the public version of the official record. Information not marked confidential will be included in the public version of the official record without prior notice. If you have any questions about CBI or the procedures for claiming CBI, please consult the technical person identified in the ``FOR FURTHER INFORMATION CONTACT'' section.

V. What Does This Action Do?

This action announces the availability of data that were submitted to EPA after the comment period closed for the December 6, 1994 proposed rule (59 FR 62788) (FRL-4167-1). These data, as described below, are available for review and comment. This action also solicits additional information and comment on the potential risks of exposure to PCBs, and the use and concentration of PCBs found in the non-liquid PCB (NLPCB) applications that are the subject of this action. EPA proposed to amend its rules under the Toxic Substances Control Act (TSCA) to authorize the use of NLPCBs and their distribution in commerce, and to impose related information collection requirements. These issues had also been discussed in the Advanced Notice of Proposed Rulemaking (ANPR) of June 10, 1991 (56 FR 26740).

In advocating the removal of the conditions that were included in the December 6, 1994 proposal (e.g., notification, marking, air monitoring and standard wipe tests, remediation, repair and/or removal, reporting and recordkeeping requirements), some commenters submitted supplemental data that they claim showed that these NLPCB uses ``do not pose a risk above acceptable measures.'' However, EPA did not include this use authorization in the final rule which was published on June 29, 1998 (63 FR 35384) (FRL-5726-1) because insufficient data were available to enable the Agency to make the no unreasonable risk finding for many of the NLPCB uses. These data submissions, as well as an assessment of those data are available for inspection (see the listing of reference documents at Unit VIII. of this action) in the TSCA Public Docket Office. In the absence of data which could be used to determine whether a correlation exists between PCB bulk sample results and PCB surface contamination, several conservative assumptions were used in the draft risk document (see Ref. 23 ``Revised Draft, Assessment of Risks Associated with Proposed PCB Use Authorizations''). The Agency solicits public comment on these materials, and in particular, would appreciate comments, which are supported by data, regarding the draft risk analysis.

VI. What Non-liquid PCB Uses Are of Interest to EPA?

In the ANPR (June 10, 1991), EPA solicited information on unauthorized uses of NLPCBs in existing applications, and in the NPRM of December 6, 1994 (59 FR 62788), EPA solicited comments regarding a provision which would authorize the use of these NLPCBs. Items not authorized by the regulations but currently in use and identified as containing PCBs include, but are not limited to, some wool felt insulating materials, plastics, paint formulations, small rubber parts, adhesive tape, insulating materials used in electrical cabling, fluorescent light ballast potting materials, gaskets in heating, ventilation and air conditioning and other duct systems, caulking,

coatings for ceiling tiles, flooring and floor wax/sealants, roofing and siding materials, adhesives, waterproofing compounds, anti-fouling compounds, fire retardant coatings, coal-tar enamel coatings for steel water pipe and underground storage tanks (i.e., American Water Works Association (AWWA) Standard C203 coal tar enamel), and any number of other chemical uses such as additives and plasticizers. The PCB contamination in these various products was reported to range from <1 to 688,498 parts per million (ppm). EPA is interested in data for those NLPCBs that do not satisfy the criteria for excluded PCB products, recycled PCBs, or inadvertently generated PCBs (i.e., generally historic uses of PCBs at concentrations of <50 ppm PCB) which are authorized by the current regulations. (For a detailed discussion, see 40 CFR 761.3 for the definitions of ``excluded PCB products'' and ``recycled PCBs.'' Also see the definition for ``excluded manufacturing processes'' at 40 CFR 761.3, the regulatory requirements for excluded manufacturing processes at 40 CFR 761.185 and 761.187, and the requirements for inadvertently generated PCBs at 40 CFR 761.193.)

A brief description of the non-liquid PCB uses which have been reported to EPA follows. Limited information regarding many of these products is contained in the NPRM (see 59 FR 62809-62811, December 6, 1994), as well as the comments and data that were submitted to EPA in response to the ANPR and NPRM (OPPTS-66009/66009A) and are summarized below. The following descriptions also reflect information gained by EPA over the course of implementing the PCB program. Additional non-liquid PCB products, when discovered, may also be covered by this use authorization. Therefore, information concerning unauthorized NLPCB uses which have not been identified above are also of interest and may be submitted to the Agency.

<bullet> Insulation (e.g., wool felt, foam rubber and fiberglass) and sound-dampening materials. These materials have been found to contain PCBs at concentrations which exceed 50 ppm. Wool felt and foam rubber insulation, as well as sound-dampening materials have been discovered in naval vessels and may include ships of all types, as well as nuclear submarine reactor

[[**Page** 69360]]

compartments. PCB concentrations were reported to range from <1 ppm to a high of 688,498 ppm (Ref. 15). Fiberglass insulation containing PCBs has been found in federally owned buildings at various concentrations. Bulk PCB concentrations were reported to range between <1 to 39,158 ppm, and surface contamination was reported to range between 7.5 to 188 micrograms per 100 square centimeters. All air samples were reported by the submitter as being below the analytical detection limit which was generally reported as 0.97 micrograms per cubic meter (Ref. 3). The use of PCB-contaminated fiberglass insulation may be widespread throughout the United States.

<bullet> Plastics, small foam rubber and rubber parts, adhesive tape, and insulating materials used in electrical cabling. PCBs may be in many of the components of electric cable at concentrations ranging from <1 ppm PCBs to 280,000 ppm PCBs (Refs. 15 and 16). In addition to electrical applications, these components may be in widespread use in marine and industrial applications. It is not clear whether PCB-containing cables would be found in residential settings.

<bullet> Paint formulations. During the 1950-1960 time frame, PCBs were added to paint formulations as drying oils (resins) and plasticizers or softening agents (liquids) in concentrations that range from 10-12% PCBs (100,000-120,000 ppm) to 20-30% PCBs (200,000-300,000 ppm). Concrete surfaces and equipment, as well as marine or waterproofing applications, used at Federal installations and in the manufacturing and industrial sectors may have painted surfaces contaminated with PCBs. Data provided to EPA indicate that PCBs have been found in dried paint at concentrations that range from <1 ppm to 97,000 ppm (Refs. 9 and 13).

<bullet> Fluorescent light ballast potting materials. Older fluorescent lamps (i.e., manufactured prior to 1978) may contain a small PCB Capacitor with 100% PCBs (i.e., 1,000,000 ppm) and/or petroleum-asphalt insulating material contaminated with PCBs (Ref. 6).

<bullet> Gaskets in heating, ventilation and air conditioning (HVAC) and other duct systems. It is not known whether this particular PCB application represents a widespread use. PCBs were discovered in older government buildings at concentrations of 18,900 ppm (Ref. 16); however, given the generic nature of the specifications for this material, these gaskets also may have been installed in commercial and industrial buildings. Additionally, ventilation system gasket materials made from processed cork that have been contaminated with PCBs at concentrations up to 6,400 ppm PCB have been found on naval vessels (Ref. 15).

<bullet> Coatings for ceiling tiles. Ceiling tiles contaminated with PCBs have been found at educational institutions with surface level PCB concentrations at a maximum of 53 ppm. However, the availability and dissemination in the marketplace of this material is not known.

<bullet> Flooring and floor wax/sealants. A commenter indicated that these materials have been found to contain PCBs; however, little else is known about specific PCB concentrations, application(s) or its availability and dissemination in the marketplace (Ref. 2).

<bullet> Roofing and siding materials. This material was manufactured and marketed worldwide as Robertson Protected Metal (RPM) and Galbestos to airlines, railroads, chemical plants, steel mills, mines, industrial/manufacturing facilities, and military facilities. PCB concentrations have been found to range from <2 ppm to 30,000 ppm (59 FR 62809).

<bullet> Caulking and grout. Very little is known about contaminated caulking and grout, their specific applications and dissemination in the marketplace. Samples of caulking that have been contaminated with PCBs have been found in a setting previously used as a school at a maximum concentration of 310,000 ppm PCBs (Ref. 12). Likewise, grout has been found in the joints and cracks of a water reservoir at 2,700 ppm PCB and on marine vessels at concentrations which range from <1 to 9,100 ppm PCB (Ref. 15) in the mess room and other onboard locations.

<bullet> Waterproofing compounds, anti-fouling compounds, and fire retardant coatings. These non-liquid uses of PCBs have been found in military, marine and other applications; PCB concentrations have been found as high as 59,000 ppm PCB.

<bullet> Coal-tar enamel coatings for steel water pipe and underground storage tanks (i.e., AWWA C203 coal tar enamel). This coating was previously approved for use by EPA pursuant to the Safe Drinking Water Act and has been used in some older Army, municipal and other water supply systems. The PCB concentration in this enamel may range from non-detect to 1,264 ppm (Refs. 11 and 26). EPA withdrew and thereby invalidated its list of acceptable drinking water products on April 7, 1990, and since that time, individual States have had the authority to regulate the sale and/or use of specific products. The Agency has never used its authority under TSCA to control the use of this indirect additive to a drinking water system.

VII. What Data Are Currently Available to EPA?

The following table provides information on the maximum PCB concentrations found in sample data that have been submitted to EPA. A review of this table, along with the criteria discussions that follow, will give you some indication of the NLPCBs that EPA could possibly authorize under the TSCA PCB regulations and the data that would be useful in order to evaluate the risks of exposure to PCBs associated with specific NLPCB uses. Unit VI. of this action provides additional guidance on the type of data that EPA needs to finalize a NLPCB use

authorization.

Table 1.--Maximum PCB Concentrations From Sample Data

Material	Bulk Sample (mg/kg or ppm)	Standard Wipe Sam (<greek-m>g/100 c
Adhesive tape	1,400	No data available
Anti-fouling compounds	No data available	No data available
Caulking	310,000	No data available
Ceiling tiles	53	1.3

[[Page 69361]]

Cloth/paper insulating material	12,000	No data available
Coal-tar enamel coatings	1,264	No data available
Dried paint	63,300¹ 97,000²	2,560<SU 40<SUP>2
Fiberglass insulation³	39,158	188
Fire retardant coatings	No data available	No data available
Flooring and floor wax/sealant	No data available	No data available
Fluorescent light ballast potting material	No data available	No data available
Foam rubber insulation	13,100	No data available
Foam rubber parts	1,092	No data available
Grout	9,100	No data available
Insulating materials in electric cable	280,000	No data available
Plastics/plasticizers	13,000	30⁴
Processed cork ventilation system gasket material	6,400	No data available

Roofing/siding material	22,000	No data available
Rubber parts	84,000	No data available
Sound-dampening material	No data available	No data available
Thermal insulation	73,000	No data available
Waterproofing compounds	No data available	No data available
Wool felt gaskets	688,498	No data available

¹ Non-degraded gray chlorinated rubber-based paint, Federal specificatic prevent brittleness.
² Semi-gloss paint; white and light blue, Amercoat 33HB with red Amercoa
³ Athough sampling results for this material are available from the dock time the draft risk analysis was completed.
⁴ Surface PCB concentration taken from wipe samples of plastic cable.

EPA's criteria for authorizing a NLPCB use. EPA will apply certain criteria to test data results when determining whether a material that is suspected of containing PCBs should be authorized for use. For instance, EPA has received some data that would not satisfy the criteria stated below. These data showed positive wipe sample results from contamination of the surface by PCBs. However, the bulk sample did not contain PCBs. This type of information is not useful for authorizing a NLPCB application. EPA believes these results indicate contamination due to a PCB spill rather than contamination associated with the manufacture of a product containing PCBs. EPA will not authorize the use of spilled PCBs. If you own items that have been contaminated as a result of a spill, you should either decontaminate or dispose of the item(s). The objective of the use authorization is to allow the continued use of those PCB-containing materials that do not pose an unreasonable risk. The use of these materials is currently unauthorized. Since some items currently being considered for the NLPCB use authorization may be contaminated with PCBs due to their proximity to PCB liquids, as opposed to being a PCB containing item, EPA intends to use the following criteria for determining whether materials suspected of containing PCBs should actually be considered for the NLPCB use authorization.

<bullet> If the bulk sample contains PCBs, but the wipe sample does not contain detectable levels of PCBs, then the PCBs have not significantly migrated from the material onto the surface. If there are no PCBs present on the surface, then it is assumed that no significant releases of PCBs to air are occurring. Therefore, air sampling would not be necessary. In

[[**Page** 69362]]

this situation, there would most likely be a low risk of exposure to PCBs, since PCBs are being released from the material at a low or non-existent rate. EPA could most likely authorize this use without some or all of the conditions listed in the proposal (see 59 FR 62857).

<bullet> If the bulk sample contains PCBs that are migrating out onto the surface, then the wipe sample will be expected to contain PCBs. Likewise, if the PCBs are being released from the surface into the air, then the air sample will be expected to contain PCBs. Note

that the air sample will most likely contain PCBs at more dilute concentrations than those in the surface levels. EPA may or may not authorize this use, depending on the risk of exposure to PCBs.

<bullet> If neither the bulk nor the wipe sample contains PCBs, but the air sample does contain PCBs, then the PCBs are most likely from a source other than the material being tested. EPA cannot use these data to support a use authorization.

<bullet> If there are no PCBs in the bulk sample, but the wipe sample contains PCBs, then the PCBs are most likely from a spill rather than from the material being tested. EPA cannot use these data to support a use authorization.

The following chart provides a summary of the criteria that EPA will use to authorize the use of certain non-liquid PCBs.

Table 2.--Criteria for Authorizing the Use of NLPCBs

Bulk Sample	Wipe Sample	Air Sample
Contains PCBs	No PCBs	No PCBs or data are available
Contains PCBs	Contains PCBs	Contains PCBs
No PCBs	No PCBs	Contains PCBs
No PCBs	Contains PCBs	May or may not cont PCBs

In addition to the risk of developing cancer, PCBs also have significant non-carcinogenic effects, including neurotoxicity, reproductive and developmental toxicity, immune system suppression, liver damage, skin irritation, and endocrine disruption. These toxic effects should also be considered when assessing risk (Ref. 27). Therefore, in addition to evaluating the cancer risks associated with these NLPCB uses, the Agency intends to consider the potential non-cancer effects. It should be noted, however, that the Agency is currently conducting a reassessment of the non-carcinogenic effects of PCBs in order to determine whether the reference dose (RfD) factors for PCBs currently in the Agency's Integrated Risk Information System (IRIS) can be updated. It is possible, therefore, that the current RfDs may not be retained. Therefore, detection limits that are estimated using the current RfDs may not be low enough after the Agency's re-evaluation is complete. Thus, achieving the lowest possible detection limits is the recommended course of action in order to avoid reanalyzing samples if these RfDs are lowered.

VIII. What Data Does EPA Need?

EPA received some very useful data, but much of these data do not address the Agency's objective of assessing the risk of exposure due to the use of PCBs in a particular product. For example, wipe samples from the wall of a ship's engine room or air samples from living quarters cannot be used to evaluate the risk from air handling system gaskets when other potential sources of PCBs may be present on the ship or when no gaskets containing PCBs are present in the ship's handling system. It would be useful to have both surface results and bulk sampling results so that possible relationships between bulk and surface concentrations could be better defined. EPA also needs a better

understanding of the individual sampling results including summary statistics such as range, median mean, standard deviation, and geometric mean in order to better determine if the results are representative of the sample population. Likewise, it is necessary to know the population characteristics with respect to PCB concentration, number of data points collected within a population, and how those data points represent the overall population of the items in use.

EPA would like to use the data to assess exposure via dermal contact and inhalation for most materials, as well as via incidental ingestion, as appropriate (e.g., paint chips). Surface samples are preferable for estimating dermal exposures because they reflect the PCB concentrations that individuals actually contact. EPA has data on a limited number of uses for which there are both bulk PCB concentrations and surface concentrations for the same material. Therefore, information on both bulk sample concentrations and wipe sample concentrations would be useful for defining the relationship between bulk and surface samples for use in dermal exposure assessments. Bulk sample data are also needed to assess incidental ingestion for some materials. EPA has no data on the volatilization or entrainment of PCBs from individual uses. This information would greatly facilitate the estimation of inhalation risk. Preliminary estimates were based on theoretical calculations, often employing very conservative approaches (Refs. 23 and 24). Also, the data EPA is currently using to assess dermal and inhalation risk for most uses is relatively old. Newer data would be useful in providing updated estimates.

As suggested earlier, EPA is interested in being able to detect cancer risks at or below 1 x 10⁻⁶ and non-carcinogenic hazards at or below a hazard index of 1. Because traditional sampling techniques may not have sufficiently low practical limits of quantitation (PQL) for EPA to determine that these NLPCB uses do not pose unreasonable risks, the approach to sampling may require much larger surface areas, much larger air volumes, or much more sensitive chemical analysis procedures than previously used. Consideration should also be given to achieving the lowest possible detection limits because of potential changes to the current RfDs.

Prior to finalizing a rule that would authorize the conditional use of these materials, the Agency is soliciting public review of and comment on the data that were submitted subsequent to

[[**Page** 69363]]

the official comment period for the December 6, 1994 NPRM. Data supporting a non-conditional use authorization for NLPCBs (i.e., a provision which would eliminate or minimize notification, marking, air monitoring and standard wipe test, remediation, repair and/or removal, reporting and recordkeeping requirements) may be submitted for the use of PCBs in any of the various applications identified above. A listing of the data elements that are required for this analysis is provided below. Please note that due to the uncertainty associated with updating the reference dose (RfD) for PCBs, the following discussions focus solely on the risk of developing cancer. In the absence of an updated RfD, the Agency is inclined to continue to use conservative risk assumptions for issues associated with the use of PCBs.

1. Wipe sample data for each of the products (or classes of products, i.e., paint) for which use would be authorized. Data should be collected from products that are known to contain PCBs (i.e., based on bulk sample results or from historic knowledge). Also, the detection limits for these materials should be sufficiently low to ensure that the cancer risks and non-carcinogenic hazards can be calculated down to less than 1 x 10⁻⁶ and below 1, respectively (note that the current RfDs for PCBs are likely to change), in order for the NLPCB use to be authorized. EPA recommends using the lowest achievable detection limit possible.

2. Transfer data. Information on the transfer of PCBs to human skin

from the non-liquid PCBs listed in Table 1 of Unit V.

3. Air monitoring data for each of the products (or classes of products, i.e., paint) for which use would be authorized. Data should be collected from products that are known to contain PCBs (i.e., based on bulk sample results or from historic knowledge). Also, the detection limits for these materials should be sufficiently low to ensure that the cancer risks and non-carcinogenic hazards can be calculated down to less than 1 x 10⁻⁶ and below 1, respectively. EPA recommends using the lowest achievable detection limit possible.

Each product (or class of products, i.e., paint) sampled must contain high enough concentrations of PCBs in their bulk sample to be representative of the highest concentrations of PCBs in the product (or class of products, i.e., paint). For example, commenters provided information that paint formulations with 10-12% PCBs were recommended in the commercial formulation manuals. Therefore, EPA is especially interested in wipe sample and air monitoring data for products such as paints with bulk sample levels of 10-12% PCBs. In addition to the collected data, EPA requests the sampling plan that was used in collecting the data and a description of the quality assurance/quality control procedures that were applied to the data set.

In order to facilitate EPA's review of the data (i.e., bulk, standard wipe, and air sample results) on NLPCB containing materials, you should consider the following in order to judge the adequacy of your data submissions:

<bullet> Are the bulk and wipe samples of specific materials (i.e., uses) rather than of areas (e.g., engine room, mess deck/galley, berthing, pilot house, etc.)?

<bullet> Do you have corresponding samples (i.e., both bulk and wipe samples) for the specific materials?

<bullet> Did you collect air samples using procedures for chamber testing in order to differentiate PCBs that offgas from specific materials rather than from PCBs that are in ambient air?

EPA recommends using the lowest achievable detection limit possible so that cancer risks of 1 x 10⁻⁶ or non-cancer hazards of 1 may be detected. The detection limits at these risk levels may be estimated using cancer slope factors or reference doses for PCBs developed by EPA. The lower of the detection limits based on either cancer or non-cancer endpoints should be used to ensure that both types of effects could be detected.

If commenters and/or data submitters would like to submit comments or data anonymously, EPA will accept anonymous comments and data submissions (e.g., via a third party). However, it is important that EPA be able to contact someone should questions arise concerning the collection methodology, analytical procedures or other technical issues, even if through a third party.

IX. List of Reference Documents

The following documents are available in the combined docket for OPPTS-66009 (OPPTS-66009A, OPPTS-66009B and OPPTS-66009C). Documents identified with an asterisk were submitted to EPA after the official comment period for the proposed rule had closed. Since these data will be used in the Agency's decision making process, this listing is intended to ensure ample opportunity for public review and comment on pertinent documents.

1. Aluminum Company of America. Comments from Connie Glover Ritzert to the TSCA Nonconfidential Information Center, USEPA. Subject: Comments on Proposed Amendments to the TSCA PCB Regulations (59 FR 62788) - OPPS[sic]-66009A; FRL-4167-1 (May 3, 1995) (see C1-239, Table 3).

2. Consumers Power. Comments from William L. Beckman to the TSCA Nonconfidential Information Center, USEPA. Subject: Document Control Number OPPTS-66009A; FRL-4167-1, U.S. Environmental Protection Agency, December 6, 1994, Proposed Amendment to 40 CFR Part 761, Disposal of

Polychlorinated Biphenyls (PCBs) (May 4, 1995) (see C1-179).

3. General Services Administration. Letter from David Spannbauer to Barry Breen, Federal Facilities Enforcement, USEPA, Subject: PCBs in Fiberglass Insulation in Federally Owned Buildings (1994) With Enclosures (see B3-032).*

4. General Services Administration. Letter from Casey Jones to Robert Harding, Section Chief, Toxic Substance Branch, USEPA, Subject: PCB Contamination at the Wallace F. Bennett Federal Building (date not discernible) With Enclosure (see B3-033).*

5. General Services Administration. Letter from Casey Jones to Kim Le, USEPA, Subject: Update on PCB Contaminated Insulation at the Wallace F. Bennett Federal Building (February 2, 1994) With Enclosure (see B3-034).*

6. Kominsky, John, NIOSH et al. ``Polychlorinated Biphenyl Contamination Resulting from Fluorescent Light Ballast Burnout (Draft).'' (April 14, 1986) (see C3-010).

7. Larcom, B.J.; Cline, J.M.; Merrill, E.A.; Jederberg, W.W.; Still, W.R. ``Risk Assessment of Polychlorinated Biphenyls On-board Navy Ships.'' A report prepared for the U.S. Navy. AL/OE-TR-1996-0153. WRAIR-TR-NMRI-96-72 (1996) (see C3-001).*

8. Parsons Engineering Science, Inc. ``Risk Review Paper, Evaluation of Existing Data for PCBs in Non-liquid Material (NLPCBs).'' A report prepared for Environmental Management Directorate, Robins Air Force Base, GA and Air Force Material Command Under USAF Contract No. F41624-94-D-8136, Delivery Order No. 0069 (1997) (see C3-002).*

9. Ropes Gray. Letter from Mark A. Greenwood to Mr. John H. Smith, USEPA. Subject: Response to Data Request on PCBs in Paint (July 21, 1998) (see C3-017).*

10. Ross, M.; Mangum, S.; Adema, C. ``Sampling and Analysis of Polychlorinated Biphenyls (PCBs) in Navy Ship Cables.'' A report prepared by the Naval Sea Systems Command, Code 05V, Report No. 9510, Ser. 6110/121 (1993) (see C1-107, Enclosure 11).

[[**Page** 69364]]

11. U.S. Army. Comments from Lewis D. Walker to Joseph S. Carra, USEPA. Subject: Comments on Proposed Polychlorinated Biphenyl Rule (May 2, 1995) (see C1-260).

12. U.S. Army Corps of Engineers, New England Division. ``Final Site Investigation Report for Campbell, Lyle, Stone and Otis Memorial Schools, Bourne, MA.'' A report prepared by Stone and Webster Environmental Technology and Services under Delivery Order 17, Contract No. DACW33-94-D-007 (1996) (see B3-001).*

13. U.S. Department of Energy. Letter from Thomas T. Traceski to Mr. John Melone, USEPA. Subject: Results of Testing at the Savannah River Site (October 29, 1988) (see C3-018).*

14. U.S. Department of Energy, Schenactady Naval Reactors Office. Letter from A.R. Seepo to Kim Tisa, USEPA Region 1. Subject: Documentation of Research Regarding Historical Uses of PCBs in Paint (April 19, 1995) (see C3-004).

15. U.S. Department of the Navy. Electronic submission; CD-ROM containing spreadsheets of PCB sample results, Excel for Office 97. Samples taken from various naval vessels; Files: PCBEPA01.XLS (see Sheet 1) and PCBEPA02.XLS (see Sheet 1) (see C3-019).*

16. U.S. Department of Transportation, Maritime Administration. Appendices from Report No. MA-ENV-820-96003; Appendix D, Sampling and Analysis (January 1997) and Appendix E, Survey of Ships and Materials (July 1997) (see B3-030).*

17. U.S. Department of Transportation, U.S. Coast Guard. Memorandum from Alan M. Steinman, Chief, Office of Health and Safety to Chief, Office of Engineering, Logistics and Development. Subject: Health Risk Evaluation of 65' WYTL and 82' WPB Class Cutters (January 18, 1996) With Enclosure: ``PCB Health Risk Evaluation of 65' WYTL and 82' WPB Class Cutters, Office of Health and Safety, Safety and Environmental

Health Division, January 1996.'' (see B3-031).*
18. Versar Inc. Memo from Linda Phillips to Tony Baney, USEPA. Subject: Review of PCB Data for DOE Savannah River Site (November 13, 1998) (see B3-038).*
19. Versar Inc. Memo from Linda Phillips to Tony Baney, USEPA. Subject: Review of Ropes Gray Sampling Data (October 12, 1998) (see B3-037).*
20. Versar Inc. Memo from Linda Phillips to Peggy Reynolds, USEPA. Subject: Data Submissions for Risk Analysis for Authorized Uses of PCBs (December 8, 1998) (see B3-039).*
21. Versar Inc. Memo from Linda Phillips to John Smith, USEPA. Subject: Review of Air Force Risk Assessment (November 10, 1997) (see B3-035).*
22. Versar Inc. Memo from Linda Phillips to John Smith, USEPA. Subject: Review of U.S. Coast Guard PCB Risk Assessment (March 13, 1998) (see B3-036).*
23. Versar, Inc. ``Revised Draft, Assessment of Risks Associated with Proposed PCB Use Authorizations.'' A report prepared for the U.S. Environmental Protection Agency under Contract No. 68-W6-0023, Work Assignment No. III-3 (March 12, 1999) (see B3-040).*
24. Versar, Inc. ``Revised Preliminary Draft, Assessment of Risks Associated with Proposed PCB Use Authorizations.'' A report prepared for the U.S. Environmental Protection Agency under Contract No. 68-W6-0023, Work Assignment No. II-9 (October 14, 1997) (see E3-021).*
25. Westinghouse Savannah River Company. Letter from Nancy Lowry to David K. Hannemann, USEPA. Subject: Detailed Information on PCB Analyses of Painted Surfaces (May 28, 1997) (see C3-005).*
26. U.S. Army Corps of Engineers. Comments from Daniel R. Burns to the TSCA Nonconfidential Information Center, USEPA. Subject: Comments on the Proposed Rule on the Disposal of Polychlorinated Biphenyls (April 20, 1995) (see C1-139).
27. U.S. Environmental Protection Agency. PCBs: Cancer Dose-Response Assessment and Application to Environmental Mixtures, EPA/600/P-96/001 (September 1996) (See B3-026).*
28. Midwest Research Institute. ``Polychlorinated Biphenyl Analysis of Cable Samples from U.S. Navy Ships.'' A report prepared for the U.S. Environmental Protection Agency under Contract No. 68 DO-0137, Work Assignment No. 30 (August 14, 1992) (See B3-043)*.

List of Subjects in 40 CFR Part 761

Environmental protection, Hazardous substances, Polychlorinated biphenyls, Reporting and recordkeeping requirements.

Dated: November 29, 1999.
Susan H. Wayland,
Deputy Assistant Administrator for Prevention, Pesticides and Toxic Substances.
[FR Doc. 99-32079 Filed 12-9-99; 8:45 am]
BILLING CODE 6569-50-F

The Chemical Formulary

A Collection of Valuable, Timely, Practical, Commercial Formulae and Recipes for Making Thousands of Products in Many Fields of Industry

VOLUME XIII

Editor-in-Chief

H. BENNETT, F.A.I.C.

Director, B. K. Laboratory
Miami Beach, Florida

CHEMICAL PUBLISHING COMPANY, INC.

New York

1967

EPA 560/6-76-005

PCBs IN THE UNITED STATES INDUSTRIAL USE AND ENVIRONMENTAL DISTRIBUTION

TASK I

FEBRUARY 25, 1976

FINAL REPORT

U.S. ENVIRONMENTAL PROTECTION AGENCY
OFFICE OF TOXIC SUBSTANCES
WASHINGTON, D.C. 20460

Table 1.2-1

Estimates of Cumulative PCBs Production, Usage, and Gross Environmental Distribution in the United States Over the Period 1930-1975 in Millions of Pounds

	Commercial Production	Commercial Sales	Industrial Purchases of PCB	PCBs Currently in Service	PCBs Currently in Enviroment	PCBs Destroyed	Estimated Reliability of Values
U.S. PCB Production	1,400						+ 5% - 20%
Total U.S. PCB Imports	3						± 30%
U.S. PCB Domestic Usage		1,253					+ 5% - 20%
Total U.S. PCB Exports		150					± 20%
PCB by Use Category:							
Petroleum Additives			1				± 50%
Heat Transfer			20				± 10%
Misc. Industrial			27				± 15%
Carbonless Copy Paper			45				± 5%
Hydraulics and Lubricants			80				± 10%
Other Plasticizer Uses			115				± 15%
Capacitors			630	450			± 20%
Transformers			335	300			± 20%
Uses Other than Electrical				8			± 60%
PCB Degraded or Incinerated:							
Environmentally Degraded						30	± 70%
Incinerated						25	± 10%
Landfills and PCBs in Dumps:							
Cap. and Trans. Production Wastes					110		± 20%
Obsolete Ele. Equipment					80		± 40%
Other (paper, plastic, etc.)					100		± 40%
Free PCBs in the Environment (soil, water, air, sediment)					150		± 30%
Total	1,403	1,403	1,253	758	440	55	

DEPARTMENT OF THE ENVIRONMENT

Waste Management Paper No 6

Polychlorinated biphenyls

Wastes Technical Division

HMSO

3.8 With Aroclors, the full trade name usually indicates the product's chlorine percentage.

- For example, Aroclor 1260 is on average 60% chlorine by weight; Aroclor 1242 is 42% chlorinated.

- There are exceptions: for example, Aroclor 1016 is 41% chlorinated.

3.9 The toxic characteristics of commercial mixtures depend on the relative concentrations of individual congeners.

3.10 Askarel is a generic name for electrical insulating liquids containing PCB, generally diluted with polychlorinated benzenes to reduce viscosity.

Applications and use

3.11 The various PCB formulations possessed unique properties: PCB had a wide range of applications.

3.12 Because of their fire resistance, high resistivity, chemical stability, dielectric strength and low power factor they were particularly used in the electrical industry.

- In electricity generating and distribution, PCB was mainly a capacitor impregnant and transformer coolant.

  - Diluent solvents such as tri- and tetrachlorbenzene were often used in conjunction with PCB in transformer fluids to reduce viscosity.

- Other electrical applications included

  - wire and cable coatings
  - impregnant for insulating materials.

3.13 Uses in electrical equipment and heat exchangers are "closed applications": the material is contained for the duration of the life of the equipment.

- Although UK production of PCB ceased in 1976, sales of PCB for use in **closed** applications were still allowed: they were prohibited in 1986.

3.14 PCB was included in the formulation of a wide range of products to improve performance characteristics. It was used in

- high temperature and high pressure lubricants
- cutting oils
- sealing compounds (for the construction industry)

- adhesives
- plastics and rubbers
- insecticides
- paints and varnishes, and
- almost every branch of the surface coating industry including carbonless copying paper.

These are "open applications": the material is consumed during use or dispersed on disposal.

- Sales for **open** applications (**except** hydraulics[12]) ceased in the UK in 1972.

3.15 Other equipment uses included

- vacuum pump oils
- fire resistant hydraulic media (for use in underground mining)
- hydraulic couplings (British Rail).

3.16 Some of the uses listed in the three preceding paragraphs were uncommon in the UK.

- In particular, applications of PCB as heat transfer fluids and in certain types of mining equipment were largely outside the UK.

- Up to the mid-1970s, most mining equipment used in British mines was manufactured in the UK: PCB-containing equipment was probably not imported.

3.17 **The major source of waste arisings to be dealt with under the plan will be the closed applications.** Virtually all PCB wastes from the open-ended sources have been dispersed or disposed of.

Quantities manufactured

3.18 Taking the industrialised world as a whole, PCB was manufactured for about fifty-five years, from around 1930 to the mid-1980s.

3.19 During that time, the western industrialised world probably produced about 1.1 million tonnes of PCB. Production in the former Eastern Bloc is not known.

3.20 In the UK, production started in 1951 and ceased in 1976.

---

[12] Hydraulics are included in this class because operational conditions and maintenance requirements generally led to significant losses.

The Chemistry of PCB's

O. Hutzinger
National Research Council
Halifax, Nova Scotia

S. Safe
Department of Chemistry
University of Guelph
Guelph, Ontario

V. Zitko
Fisheries and Marine Service
St. Andrews, New Brunswick

published by:

18901 Cranwood Parkway, Cleveland, Ohio 44128

Chapter 2

COMMERCIAL PCB PREPARATIONS: PROPERTIES AND COMPOSITION

Introduction

The polychlorinated biphenyls (PCB) are a class of chlorinated, aromatic compounds which have found widespread applications because of their general stability and inertness as well as their excellent dielectric properties.

Most information on the technical preparation, chemical and physical properties, and general characteristics of PCB comes from trade publications[3,25,26] and articles in technical encyclopedias.[18,42]

PCB's have been prepared industrially since 1929 and are now produced in many industrial countries (Table 1). Most information by far is available on Monsanto's PCB preparations (the Aroclors) and this particular brand will serve to discuss various aspects of PCB in general.

All Aroclor products are characterized by a four-digit number. The first two digits represent the type of molecule; 12 = chlorinated biphenyl, 54 = chlorinated terphenyl.* Aroclor 25-- and 44-- are blends of PCB and chlorinated terphenyls (75% and 60% PCB, respectively). The last two digits give the weight percent of chlorine (see Table 2).

Recently, a new PCB product of the Aroclor series "1016" was introduced[26] which contains 41% chlorine per weight but in which the penta-, hexa-, and heptachlorobiphenyl content has been significantly reduced.

TABLE 1

The World's Major Producers of PCB

Producer	Country	Tradename of PCB
Monsanto	U.S.A. and Great Britain	Aroclor®
Bayer	Germany	Clophen®
Prodelec	France	Phenoclor and Pyralene®
Kanegafuchi	Japan	Kanechlor®
Mitsubishi-Monsanto	Japan	Santotherm®
Caffaro	Italy	Fenclor®
Sovol	U.S.S.R.	
Chemko	Czechoslovakia	

General Information and Properties of PCB

Use of PCB

The outstanding physical and chemical characteristics of PCB are their thermal stability, resistance to oxidation, acid, bases, and other chemical agents as well as their excellent dielectric (electrically insulating) properties.

These and other desirable properties have led to numerous uses of PCB[7,18,25] such as dielectric fluids (capacitors, transformers), industrial fluids (use in hydraulic systems, gas turbines, and vacuum pumps), fire retardants, heat transfer applications, plasticizers (adhesives, textiles, surface coatings, sealants, printing, copy paper). Some uses of PCB classified according to grade of Aroclor are shown in Table 3.

Some chlorobiphenyls were shown to have insecticidal[9] and fungistatic[5] activity; however, they were apparently never used as pesticides although recommended for incorporation into pesticide formulations.[17,32,40]

PCB are also reported to increase the insecticidal properties of DDT,[23] lindane,[33] organophosphorus compounds,[13] and carbaryl.[31]

Production Figures for PCB

Little information is available on the worldwide production and use of PCB. The Monsanto Company has released figures[27] for domestic sales for their products (Aroclor) for the period 1957–1972.

The data are shown in graph form in Figure 1 (by use) and Figure 2 (by PCB grade). The drop in output after 1970 is due to the voluntary restriction of sales by Monsanto essentially to uses in closed systems (capacitor and transformer applica-

*Gas chromatographic and mass spectrometric analysis showed Aroclor 5460 to be a mixture of chlorinated terphenyls. Aroclor 5442, however, was found to contain chlorinated biphenyls as well.[19]

TABLE 2

Chlorine Content of Aroclor Preparations*

Aroclor	% Cl	Average number of Cl per molecule	Average molecular weight
1221	20.5–21.5	1.15	192
1232	31.5–32.5	2.04	221
1242	42	3.10	261
1248	48	3.90	288
1254	54	4.96	327
1260	60	6.30	372
1262	61.5–62.5	6.80	389
1268	68	8.70	453

*Manufacturers specifications.

TABLE 3

Use of PCB Classified to Grade of Aroclor

Current use of PCB	Grade of Aroclor used
Electrical capacitors	1016 (1221, 1254)
Electrical transformers	1242, 1254, 1260
Vacuum pumps	1248, 1254
Gas-transmission turbines	1221, 1242
Former use of PCB	
Hydraulic fluids	1232, 1242, 1248, 1254, 1260
Plasticizer in synthetic resins	1248, 1254, 1260, 1262, 1268
Adhesives	1221, 1232, 1242, 1248, 1254
Plasticizer in rubbers	1221, 1232, 1242, 1248, 1254, 1268
Heat transfer systems	1242
Wax extenders	1242, 1254, 1268
Dedusting agents	1254, 1260
Pesticide extenders, inks, lubicants, cutting oils	1254
Carbonless reproducing paper	1242

tions). Estimations on the Japanese production[20] give values of approximately 26 million pounds per year production. Of this, 40 to 50% is used for capacitors, 15% for transformer oils, 10 to 15% for heat transfer fluids, 5% for plasticizers, 15% for carbonless copying paper, and 5 to 10% for export. The annual consumption of PCB in Finland is about 250 metric tons.[15]

Preparation and Properties of PCB

PCB's are prepared industrially* by the chlorination of biphenyl with anhydrous chlorine and iron filings or ferric chloride as catalyst.[18,21] The crude product is generally purified to remove color, traces of hydrogen chloride, and catalyst which is usually achieved by treatment with alkali and distillation. The resulting product is a compli-

*The preparation of chlorobiphenyl mixtures from hexachlorocyclohexane is described in patents.[22,29,41] However, this process is not being used for any large-scale preparation of PCB.

U.S. DEPARTMENT OF COMMERCE
National Technical Information Service

PB-253 248

National Conference on Polychlorinated Biphenyls Nov. 19-21, 1975, Chicago, Illinois

Research Triangle Inst.

Prepared For
Environmental Protection Agency

March 1976

haulers. Waste haulers then dispose of these wastes in many ways, including dust control on roads, sale of oils as fuel in low-temperature boilers, and treatment and discharge to municipal sewerage systems. Fluid recovered from precipitator transformers was returned to Monsanto for incineration. In the same industrial questionnaire survey, a smaller power company reported that it had been disposing of approximately 700 pounds of PCB's per year by mixing with other waste oils and using the oils for dust control on their driveway and parking lot.

In October 1975, a 55-gallon drum of PCB transformer oil on inventory at a Michigan power company developed a leak from a defective seam. Approximately 45 gallons of the fluid soaked into the ground, resulting in more than 100 cubic yards of contaminated soil having to be removed and disposed of in an approved landfill. This situation illustrates the lack of such proper safeguards as diking around storage areas and represents an example of environmental loss from a so-called "closed-system" use.

Most industries other than utility companies using electrical transformers containing PCB's contract either the transformer manufacturer or smaller companies for servicing and do not concern themselves with the problem of disposal of the waste fluids. Frequency of servicing appears to differ between industries, varying anywhere from every 6 months to 10 years.

While water sampling programs in Michigan have failed to identify any electrical applications of PCB's as major point sources of loss to aquatic situations, environmental losses do occur which have the potential of indirectly reaching watercourses through atmospheric fallout or leeching from contaminated soils at spill or disposal sites. Losses directly to water may occur on occasion but would be difficult to detect because of their intermittent nature.

Plasticizer Applications

Plasticizer applications represent the single largest "open-ended" or dissipative use of PCB's. PCB's are or have been used as plasticizers in most countries in a wide variety of consumer products, including paints, inks, copying paper, adhesives, sealants, plastic products, and textile coatings, many of which are traded internationally (ref. 4). Monsanto's U.S. sales figures for 1970 showed a volume of nearly 20 million pounds for plasticizer applications (ref. 1). Sales for this use were discontinued in 1971. Environmental losses from past sales will likely continue for a long period of time.

Papers used in the thermographic, xerographic, or pressure-sensitive copying processes have had PCB's added as plasticizers either in the ink or paper coatings. Recycling of these papers can result in contamination of food packaging materials and other paper products (ref. 3).

Effluents from paper recycling or deinking plants also become contaminated. In Michigan, paper industry effluents have been found to commonly contain from 1 to 10 µg/l of PCB's. Contamination of fish has been identified as high as 110 mg/kg in the Kalamazoo River downstream from Kalamazoo, Michigan, where Michigan's paper industry is primarily centered. Stream sediments in the Kalamazoo area contain as much as 360 mg/kg PCB's; this is believed to be a result of past deinking processes in the area. Lower level contamination continues from processing of recycled paper but most deinking mills have ceased operation over the past 10 years.

While Monsanto stopped sales of PCB's for paper applications in 1971, one Michigan paper company recently reported to the Michigan Department of Natural Resources that several raw products that they purchase still contain PCB's. Two coloring compounds reportedly have 23 and 500 mg/kg PCB's and nearly all of their wood pulp contains from 0.5 to 1.0 mg/kg.

Burning of waste papers containing PCB's, which occurs every day, undoubtedly results in atmospheric losses PCB's have been detected in snowfall samples in Wisconsin (ref. 5).

The largest quantities of PCB's in plasticizer applications end up in dumps and landfills. Much of the material is in sealed containers or impregnated in plastics and is slowly released to the environment. Nisbet and Sarofim (ref. 6) reported that vaporization directly from paints, coatings, and plastics does occur, with losses as great as 20 percent. Open burning in landfills also releases PCB's to the atmosphere. Another source is loss to leachate from landfills. Samples of surface runoff water from nine landfills in Michigan showed five of the nine samples having PCB concentrations ranging from 0.04 to 0.30 µg/l, while the others contained less than 0.01 µg/l.

In 1970, the U.S. Food and Drug Administration identified milk contamination in Ohio, Georgia, and Florida resulting from use of a PCB-containing sealant in silos (ref. 3). In 1975 the Michigan Department of Agriculture investigated problems from this usage and found 76 dairy herds in Michigan with PCB's in milk ranging from a trace to 14 mg/l on a fat basis. Scrapings from silos on these farms contained PCB's up to 10,000 mg/kg. Eighty additional silos have been identified as having the PCB sealant and have been removed from use until a protective coating can be applied to eliminate transfer of PCB's to the cattle feed.